



ADMINISTRATIVE CENTER • 2000 N. M63 – MD 3502 • BENTON HARBOR, MI 49022 • 269.923.4646

November 9, 2012

Via E-Mail

Amanda Stevens
U.S. Environmental Protection Agency
ENERGY STAR Appliance Program
appliances@energystar.gov

Re: ENERGY STAR Draft 2 Test Method for Determining Residential Dishwasher Cleaning Performance

Dear Ms. Stevens,

We appreciate the opportunity, through the collaborative effort that has been shared between the EPA and stakeholders, to comment on this draft proposal. As we have stated in previous comments, it is imperative that the right performance metric coincide with efficiency levels that exceed what is outlined in Dishwasher Specification V5.0.

Thank you again and please call me with any questions.

Sincerely,

A handwritten signature in cursive script that reads "Nick Gillespie".

Nick Gillespie
Government Relations Manager

Whirlpool Corporation Comments
ENERGY STAR Draft 2 Test Method for Determining Residential Dishwasher Cleaning
November 9, 2012

AHAM Comments

Whirlpool Corporation is an active and engaged member of the Association of Home Appliance Manufacturers (AHAM). As such we participated in and support the comments made on this subject by AHAM regarding this matter. Our comments herein supplement those remarks.

Round Robin Evaluation

A Round Robin test is crucial to understanding reproducibility between laboratories and repeatability within laboratories in a systematic manner. One source of variation noted during procedure development was “grader-to-grader” differences; reference Appendix A of the EPA Webinar slides from 27 February 2012. Even though “grader-to-grader” variability was observed, EPA stated there was “no clear bias for high or low scores for any grade” and that “variability could be due to changes in soils”. These statements underscore the need to identify, fully understand and measure sources of variation, followed by working to minimize and control their impact. Whirlpool believes this is too vital to the integrity of the scoring process to overlook. Moreover, if the variability is not rectified, we believe the likelihood of significant variation is not only high, but larger than variation today in measured energy and water consumption values. To that end, we feel Round Robin testing is necessary and would include the following elements:

- A workshop prior to Round Robin testing, coordinated by AHAM to standardize practices and identify / address some sources of variation
- A video which memorializes best practices for soiling and grading
- A mature test procedure
- Manufacturer, testing laboratory, DOE, EPA, Navigant and other stakeholder laboratory participation (including qualification and verification labs)
- Value and premium performing models, sensing and non-sensing models
- Neutral observer to visit laboratories and gather additional data and observations
- Planned testing and repeats
- Protocols for soiling (number of soilers) and grading (number of graders)
- Assessment of grader to grader variation (multiple graders grade the same load)
- Documentation of ambient and supply information
- Use of findings to establish a cleaning performance minimum value

All factors that influence the outcome of a test cannot be completely controlled. However, estimates of reproducibility and repeatability can be made to understand the precision of measurements and manage variability. If a product is found “out of compliance” during verification testing, but close in score to the minimum, the root cause could be the product, test procedure ambiguity or laboratory protocol. Without use of a reference dishwasher, a Round Robin provides a means to understand test procedure and laboratory influence.

IEC 61923 and ASTM E 691 provide techniques for planning, conducting, analyzing and treating the results of a round robin study¹. An exemplary Round Robin test was performed by the University of Bonn in 2009.

Aligning Qualification and Verification Requirements

While Draft 2 does contain some discussion of qualification content, there is no mention of verification. Not only do we believe both are equally important to their respective roles in the process, but there is a natural synergy between the two making it optimal for verification testing plans to be developed and coordinated with qualification requirements.

Our recommendation for qualification is that energy tests for two or more dishwashers (soil sensing and non-soil sensing) would be graded (that is, all energy test units, two or more). Scores from each soil level (heavy, medium, or low) would be individually evaluated (mean or "t" statistic applied) to determine a score for the soil level. Each soil level would need to satisfy the minimum score requirement for qualification.

Regarding the verification portion, we feel the methodology should be consistent with the existing approach used for energy and water consumption. The first dishwasher would be tested and required to be within a determined (X) percent of the expected value. If this dishwasher does not pass this test, three additional dishwashers would be tested and statistical methods applied for purposes of determining compliance. Note, the energy and water consumption value of 5 percent may not be appropriate for a performance measure. As such, we would entertain the possibility of using a different wash performance percent value for ENERGY STAR Version 6.0, with further refinement in time for the subsequent ENERGY STAR specification. If Round Robin work is not complete in time for ENERGY STAR Version 6.0, a larger tolerance for wash performance verification could be specified as an interim solution.

¹ IEC 61923 Household electric appliances – Methods for measuring performance – Assessment of repeatability and reproducibility. ASTM E 691 Conducting an Interlaboratory Study to Determine the Precision of a Test Method.

#####